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Original Article

Knowledge and Awareness About Polycystic Ovarian Syndrome Among Libyan Females

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ABSTRACT

Polycystic Ovarian Syndrome (PCOS) has a major impact throughout life on the reproductive and metabolic health of the women worldwide. This study aimed to determine knowledge and awareness of PCOS among Libyan females. A cross-sectional design was adopted using self-administrative questionnaire to collect the data online on social media. Descriptive and inferential statistics were used for data analysis by SPSS. The study revealed 82 % of participated Libyan females had a good knowledge about PCOS and there is a significant association of knowledge of PCOS with the educational level of participants. The alarming concern is the low awareness of participants about long-term complications of PCOS especially about cardiovascular disease and diabetes mellitus, breast cancer, and uterine cancer. There was a good level of knowledge of PCOS among Libyan females but need to increase awareness about long-term complications such as hypertension, diabetes mellitus, uterine and breast cancer

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INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a combination of symptoms and signs that is characterized by the assembly of numerous cysts on the ovaries associated with metabolic disturbances, chronic anovulation and high male hormone levels [1]. This syndrome was first defined in 1935 by American gynecologists Irving F. Stein and Michael L. Levinthal, from whom the original name Stein-Leventhal syndrome was taken [2]. According to the World Health Organization (WHO) estimation over 116 million women are affected by PCOS worldwide [3].

The prevalence varies from one population to another depending on the diagnostic criteria and ethnicities [4]. The pathophysiology of polycystic ovaries has puzzled scientists for many years and is very difficult to explain, However, the main pathogenesis still could be hormonal imbalance and insulin resistance [5]. Hyperinsulinemia increases GnRH pulse frequency which leads to an increased LH/FSH ratio in women with PCOS, increased ovarian androgen production, reduced follicular maturation and reduced SHBG binding in turn increases free androgen [2]. The syndrome is named for the presence of multiple ovarian cysts which is develop from primordial follicles, but development ceases in the early antral phase and arranged at the cortex of the ovary and look like a "string of pearls" on an ultrasound [2]. The women having PCOS come complaining of amenorrhea or irregular menstruation besides androgenic symptoms like hirsutism or alopecia, acne, and obesity, especially abdominal distribution [6].

There are a lot of worrisome complications of PCOS, 50% of patients have primary infertility and 25% have secondary infertility, also have a higher rate of miscarriages due to luteal phase deficiency [7]. In addition, women with polycystic syndrome have a 25–30% probability of having impaired glucose tolerance and 8% of them will develop type 2 diabetes

[6]. As well, metabolic syndrome, dyslipidemia, hypertension, cardiovascular risk, and psychological disorders such as depression and anxiety [4]. Patients with PCOS have an increased risk of developing cancer, such as endometrial and breast cancers [8]. Currently, no pharmaceutical treatment can cure PCOS, but medications are given to treat the disease's clinical symptoms [3]. The lifestyle changes should be the first step in treating PCOS such as weight loss through diet and exercise which lowers serum insulin and androgen levels [9]. The National Institute for Health and Clinical Excellence in the United Kingdom suggested that women with PCOS who had a body mass index greater than 25 should take metformin [2]. The oral contraceptive pills are given to women who do not want to ovulate and are experiencing irregular menstruation [3]. This study aimed to determine knowledge and awareness of Polycystic Ovary Syndrome among Libyan females and if there is an association between the knowledge score and age, educational level, marital status and employment status.

METHODS

Study Design, setting and period

This study is a population-based cross-sectional study. It was conducted in all over the cities of Libya through the period extended between 21\10\2023 to 28\12\2023.

Study population

The study population was a Libyan woman through a social media. The inclusion criteria were all Libyan females their age between 18 and 60 years old accept to participate in this study and answered the questionnaire through social media. We had excluded females of the ages below 18 because consider themselves not adults, in addition, excludes how their age above 60 due to women 60 or above do not use social media a lot, also, who are not Libyan or live outside Libya excluded that may biased the results due to the differences in culture and education.

Sample size and sampling method

The sample size calculated by the Epi Info program was 1082 using a confidence level of 99.9%, a confidence interval of 5%, an expected frequency of 50%, and a population size was 3400000 which is the number of females in Libya in 2020 [10]. The respondents were 1688 and after excluding the uncompleted questionnaire and excluding how who met the exclusion criteria the sample in this study was 1614.

Study tool

Data was collected through the self-administrative online questionnaire with close-ended questions designed by researchers after a careful review of the literature [6]. The questionnaire was online which is distributed through social media in the Arabic language during the period of study.

The pilot study was done on 30 females to assess the reliability of the questionnaire, which was found reliable (Cronbach´s alpha =0.82). The questionnaire is divided into 5 domains includes:

1) socio-demographic characteristics such as age, residency, educational level, marital status and employment status.
2) The meaning of polycystic ovary syndrome and genetic familial inheritance of PCOs.
3) The symptoms (menstrual disturbance, hirsutism, obesity, and infertility).
4) The complications (acne, acanthosis nigricans, diabetes mellitus, hypertension, increase in cholesterol and lipids in blood, cardiovascular disease, miscarriage, uterine cancer, and breast cancer).
5) The management of PCO (there is only treatment to decrease symptoms, healthy lifestyle and diet control, oral contraceptive pills, and metformin as symptomatic treatment).

There were 20 questions about PCOS each question is answered with: I don't know which given a score 1, when the answer was no given 2, and when the answer was yes given 3. All answers with yes were correct and take score 3, so the total score of all answers were correct is 60. The knowledge in this study was categorized as adequate knowledge which obtained 60% of the total score and inadequate knowledge which obtained less than 60% of the total score.

Ethical Considerations

This study was voluntary to participants. Participants' privacy and confidentiality were assured for this study. All soft copy data was kept on a laptop that was password protected.

Data handling and analysis

The data was summarized and analyzed by using Statistical Package for the Social Sciences version 22 (SPSS 22). The frequencies and percentages used for categorical variables. Median and interquartile were used for numerical which is nonparametric in this study. The analysis was done by using the Mann-Whiteny Test and Kruskal-Wallis Test because the data in this study was not normally distributed and considers P- value less than 0.05 to be a statistically significant difference.

RESULTS

Demographics

The mean age of participated female in the study was 25±6. The majority of participated females were singles which consists 68.9% of the participants in the study. The married women were 28.4 % of participants whereas the widowed and divorced women consist just 2.7% of the sample. The participants who had Bachelors were 76.3% of participants and 16% of them had diplomas, 3.3% of participants were below diploma and 4.4% had post-graduate degree. The percentage of students and employers in this sample was 37.7%, and 33.5% subsequently, 16.2% were housewives while 12.6% had self-employment work as revealed in table 1.

Table 1. The socio-demographic characteristics of participants in the study.

Socio-demographic character	Number	Percentage
Marital status		
Single	1112	68.9%
Married	458	28.4%
Widowed and divorced	44	2.7%
Education level		
Below diploma	53	3.3%
Diploma	258	16%
Bachelor	1232	76.3%
Post graduate	71	4.4%
Employment status		
Student	609	37.7%
Housewife	261	16.2%
Employer	541	33.5%
Self-employment	203	12.6%

The knowledge of participants about the meaning of polycystic ovarian syndrome and its genetic inheritance

The participants in this study who knew that the meaning of polycystic ovarian syndrome was the presence of a lot of small cysts in ovaries was 76.1%, while those who did not know the correct meaning 5.7% and how gave a wrong answer were 18.2%. The women knew the about genetic inheritance of polycystic ovarian syndrome were 38% as shown in table 2.

Table 2. Knowledge of participants about the meaning and inheritance of polycystic ovarian syndrome.

Question	Number	Percentage
Meaning of polycystic		
I don't know	92	5.7%
One large cyst	293	18.2%
Many of small cysts	1229	76.1%
Polycystic ovarian syndrome has a genetic		
Inheritance		
I don't know	633	39.2%
No	367	22.7%
Yes	614	38.1 %

The knowledge of participants about the symptoms of polycystic ovarian syndrome

The questionnaire asked women about menstrual disturbance, obesity, hirsutism, and infertility as the symptoms of PCOS. Menstrual disturbance is known as a symptom of PCOS by 88.5% of females in this study followed by infertility which was known by 85.9% as a symptom of PCOS, in addition to hirsutism known by 77.2% of participants. The

lowest percent of knowledge was about the obesity which is known from 74% of females in this sample. Overall knowledge about the symptoms of PCOS is very good ranging from 74% for obesity as a symptom to 88.5% for menstrual disturbance (Table 3).

Table 3. Knowledge of participants about the symptoms of polycystic ovarian syndrome.

Symptoms of polycystic ovarian syndrome	Frequency	Percentage
Menstrual disturbance		
I don't know	132	8.2%
No	54	3.3%
Yes	1428	88.5%
Hirsutism		
I don't know	240	14.9%
No	128	7.9%
Yes	1246	77.2%
Obesity		
I don't know	288	17.8%
No	132	8.2%
Yes	1194	74%
Infertility		
I don't know	156	9.7%
No	71	4.4%
Yes	1387	85.9%

The knowledge about the consequences of polycystic ovary syndrome

The results revealed that 62.8% of participants knew that depression and anxiety may occur as consequences of PCOS. Approximately 55% of women knew acne, but acanthosis nigricans were known as a consequence of this syndrome by 27.9% of participants. About half of the participants knew about a miscarriage as a consequence of PCOS. The participants had a poor knowledge about hypertension, increased cholesterol levels in the blood, cardiovascular disease and diabetes mellitus are 10.8%,29.5%,8.4%, and 29.5% % of them know that subsequently. In addition to low percentage of females know that uterine and breast cancer as long-term consequences of PCOS as shown in Table (4).

Table 4. Knowledge about the consequences of polycystic ovarian syndrome.

Consequences of polycystic ovary syndrome	Number	Percentage
Acne		
I don't know	500	31%
No	218	13.5%
Yes	896	55.5%
Acanthosis nigricans		
I don't know	824	51.1%
No	340	21%
Yes	450	27.9%
Diabetes mellitus		
I don't know	918	56.9%
No	220	13.6%
Yes	476	29.5%
Increase blood pressure		
I don't know	1094	67.8%
No	346	21.4%
Yes	174	10.8%
Increase cholesterol level in the blood		
I don't know	917	56.8%
No	221	13.7%
Yes	476	29.5%
Cardiovascular disease		
I don't know	1028	63.7%
No	450	27.9%
Yes	136	8.4%

Psychological disease		
I don't know	424	26.3%
No	176	10.9%
Yes	1014	62.8%
Miscarriage		
I don't know	610	37.8%
No	194	12%
Yes	810	50.2%
Uterine cancer		
I don't know	912	56.5%
No	241	14.9%
Yes	461	28.6%
Breast cancer		
I don't know	1027	63.6%
No	457	28.3%
Yes	130	8.1%

The knowledge of participants about the management of polycystic ovary syndrome

The participants who chose the answer which there is a treatment for symptoms only were 37.8 % and those who chose the answer which there is a treatment to eliminate PCOS 42.9 % of them and 19.3% of women answered with I don't know. About the management of PCOS asked yes about healthy diet and exercise were 78.7% of females. The participants who knew about oral contraceptive pills and metformin as a management of PCOS were 43.6% and 39.8% subsequently as shown in table 5.

Table 5. Management of polycystic ovarian syndrome.

Management of polycystic ovarian syndrome	Number	Percentage
Treatment option		
There is a treatment to eliminate PCOS	693	42.9%
There is treatment for the symptoms only	610	37.8%
I don't know	311	19.3%
Healthy diet & and exercise		
I don't know	263	16.3%
No	81	5%
Yes	1270	78.7%
Oral contraceptive pills		
I don't know	653	40.4%
No	258	16%
Yes	703	43.6%
Metformin		
I don't	838	51.9%
No	133	8.3%
Yes	643	39.8%

The knowledge of participants about PCOS

The knowledge in this study was categorized as adequate knowledge which obtained 60% of the total score and inadequate knowledge which obtained less than 60% of the total score. 82% of participated females were considered to have adequate knowledge and 18% were considered to have an inadequate knowledge as shown in figure 1.

The association between a knowledge score about polycystic ovarian syndrome and socio-demographic characteristics

Kruskal Wallis H test and Mann-Whiteny Test were run to determine if there is a difference in the score of knowledge and socio-demographic characteristics because the data non-normally distribution as shown in table 6. There is a significant statistical difference between the level of education of participants and median knowledge score about PCOS, P = 0.013.

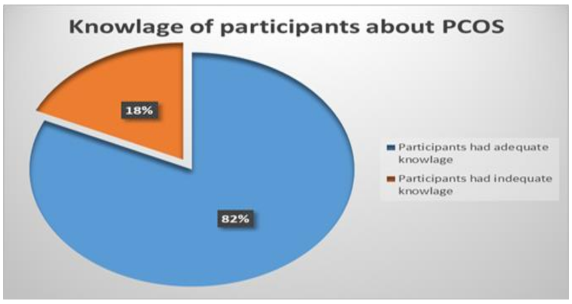


Figure 1. The knowledge of participants about PCOS.

Table 6. Association between a knowledge score about polycystic ovarian syndrome and socio-demographic characteristics.

Variables	Median (Q1-Q3)	Test	P-value
Age			
30 years or below	43(37-48)	Mann-Whiteny Test	0.527
30 years or above	43(36-48)		
Marital status			
Single	43(37-47)	Kruskal-Wallis Test	0.328
Married	43(38-48)		
Divorced/widowed	43(38-47)		
Education level			
Diploma or below	42(35-47)	Mann-Whiteny Test	0.013
Bachelors or above	43(38-48)		
Employment status			
House-wife	43(38-48)	Kruskal-Wallis Test	0.526
Employer	43(38-48)		
Self-employment	43(37-48)		
Student	42(37-47)		

DISCUSSION

This study indicates that most of the participants 82% have sufficient knowledge about polycystic ovarian syndrome, and this result is not far from a study conducted in the kingdom of Saudi Arabia, where 74.8% of participants had a good level of knowledge [11]. In contrast to Nigerian study revealed 55.6% of participants have knowledge about PCOS which is lower than that in this study that referred to difference in socio-demographic characteristics between Libya and Nigeria [12]. The current study shows that 76.1% of women have good knowledge about the meaning of Polycystic ovary syndrome. Also, this result is similar to that found in the study from kingdom Saudi Arabia [11]. However, this is controversial with a study from India which may be due to differences in education [13].
Awareness among participants in this study about obesity was high at 74% which is higher than to 32.8% in the study conducted by Alessa et al on Saudi females [6]. The present study showed that most of participants were aware of menstrual abnormalities 88.5% and infertility 85.9% as clinical symptoms, which was consistent with the study of Piltonen et al. found 98% and 77.3% females aware of irregular menstruation and infertility [14]. In this study, 55.5% of participants knew that acne is a symptom of PCOS which is similar to the Moran et al. study [15]. In addition to the hirsutism was a symptom of PCOS knew by 77.2% of participants in contrast to 47% who knew about this symptom in the Moran et al. study [15]. The majority of participants in this study knew that PCOS can cause psychological distress 62.8%, which is lower in contrast to the knowledge rate of 84% described by Sasikala et al. in India [16]. This study reveals a very low awareness among participants about diabetes mellitus 29.5% compared to another study conducted in Jordan 31.3%. [4]. This study resulted in a low percentage of the participants of 8.4% being aware of long-term complications such as cardiovascular diseases, which is consistent with the study by Alfahl et al. found it 8.3% [5]. While, 10.8% of the participants are aware that hypertension is a complication of PCOS, which is consistent with the study of Alessa et al. found it 7.7% [6]. Most participants were not aware of long-term complications such as breast and uterine cancer 28.6% and 8.1% which was differ to the study in Saudi Arabia was 30.2% [6].
In this study 78.7% of participants knew that diet and exercise were the main approaches to management, which was consistent with the results of Jena et al [17]. The current study resulted in 43.6% and 39.8% of participants were known that birth control pills and metformin were used to treat PCOS which is not consistent with the study of Alsinan and

Shaman found that 47.5% and 28.6% subsequently [18]. The present study revealed that educational level significantly influences participants' knowledge about PCOS, an expected result that was confirmed by a study conducted by Gupta et al. which showed that level of knowledge about PCOS was significantly associated with higher educational level [19].

CONCLUSION

The low level of awareness against long-term complications of PCOS that may lead to late diagnosis, prospectively late diagnosis increases the risk of hypertension, cardiovascular diseases, type 2 diabetes mellitus, endometrial and breast cancer. Therefore, adequate and the right information when available to patients speed up the diagnosis process, self-care and treatment.

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Conflicts of Interest

The authors declare no conflicts of interest.

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المعرفة والوعي بمتلازمة تكيس المبايض بين النساء الليبيات

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المستخلص:
تؤثر متلازمة تكيس المبايض بشكل كبير على الصحة الإنجابية والأيضية للنساء في جميع أنحاء العالم طوال الحياة. تهدف هذه الدراسة إلى تحديد المعرفة والوعي بمتلازمة تكيس المبايض بين النساء الليبيات. تم اعتماد تصميم مقطعي باستخدام استبيان ذاتي الإدارة لجمع البيانات عبر الإنترنت على وسائل التواصل الاجتماعي. تم استخدام الإحصاءات الوصفية والاستدلالية لتحليل البيانات بواسطة برنامج SPSS. كشفت الدراسة أن 82٪ من النساء الليبيات المشاركات لديهن معرفة جيدة بمتلازمة تكيس المبايض وهناك ارتباط كبير بين معرفة متلازمة تكيس المبايض والمستوى التعليمي للمشاركات. والقلق المثير للقلق هو انخفاض وعي المشاركات بالمضاعفات طويلة المدى لمتلازمة تكيس المبايض وخاصة أمراض القلب والأوعية الدموية ومرض السكري وسرطان الثدي وسرطان الرحم. كان هناك مستوى جيد من المعرفة بمتلازمة تكيس المبايض بين النساء الليبيات ولكن هناك حاجة إلى زيادة الوعي بالمضاعفات طويلة المدى مثل ارتفاع ضغط الدم ومرض السكري وسرطان الرحم وسرطان الثدي.
الكلمات المفتاحية: المعرفة، الوعي، متلازمة تكيس المبايض.